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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,207	03/14/2006	Shigeru Kasai	033082M244	7732
441 7590 08/21/2008 SMITH, GAMBRELL & RUSSELL 1130 CONNECTICUT AVENUE, N.W., SUITE 1130 WASHINGTON, DC 20036				
EXAMINER CHANDRA, SATISH				
ART UNIT		PAPER NUMBER		
1792				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/525,207

**Applicant(s)**

KASAI ET AL.

**Examiner**

SATISH CHANDRA

**Art Unit**

1792

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 45 - 51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 45 - 51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)
- Paper No(s)/Mail Date 1/06, 4/07
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 and 45 – 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganguli et al (US 6,772,072) in view of Kim (US 6,424,800) and Babcoke et al (US 2003/0042630).**

**Ganguli et al discloses:**

**Regarding claim 1**, a gas supply system for supplying a specific gas (Fig 1) into the processing chamber 110 wherein the said material gas is produced from solid precursor 122 via a gas passage (not labeled) extending to the processing chamber, a material reservoir tank 124 attached to one end of the gas passage for containing the solid precursor, a first carrier gas supply means connected to the said material reservoir tank into which carrier gas is fed. A gas outlet (not labeled, Fig 1) connecting the material reservoir tank 124 to the processing chamber 110.

**Ganguli et al does not disclose:**

**Regarding claim 1**, a gas diffusion chamber provided in the said material reservoir tank and a gas injection plate separating the said gas diffusion chamber and

having a number of gas injection holes, a heating means is provided in the said material reservoir tank for evaporating the said metallic compound material.

**Kim discloses:**

**Regarding claim 1**, a bubbler for supplying solid precursor by admitting gas into the bottom portion of the container (Figs 4, 5) comprising a porous gas injection plate 48, 58 through which the gas diffuses in the container and sublimates or liquefies the solid precursor. Kim further discloses a heater source 73 (Figs 5 – 7) is installed parallel to and facing the plate 58 (Column 4, lines 12 – 13). The heater source can be positioned a predetermined distance apart from the plate 58. Alternatively, the heater source 73 (Column 4, lines 60 – 61) can be embedded in the porous plate 58a (Fig 9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a gas diffusion chamber in the material reservoir tank and a porous gas injection plate separating the said gas diffusion chamber in the apparatus of Ganguli et al as taught by Kim. It would have obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a gas diffusion chamber in the material reservoir tank and a porous gas injection plate separating the said gas diffusion chamber in the apparatus of Ganguli et al as taught by Kim.

It would also have been obvious to one of ordinary skill in the art at the time the invention was made to provide a heater source in the bottom of the reservoir tank or imbedded in the porous plate in the apparatus of Ganguli et al as taught by Kim. It would have been obvious to a skilled artisan to combine prior art elements to yield

predictable results such as providing a heater source in the bottom of the reservoir tank or imbedded in the porous plate in the apparatus of Ganguli et al as taught by Kim.

The motivation for providing a gas diffusion chamber in the bottom portion of the material reservoir tank and a porous gas injection plate separating the said gas diffusion chamber in the apparatus of Ganguli et al is to uniformly introduce carrier gas in the solid metal container as taught by Kaoru et al.

The motivation for providing a heater source in the bottom of the reservoir tank or imbedded in the porous plate in the apparatus of Ganguli et al is to heat and evaporate the solid precursor in the apparatus of Ganguli et al.

**Ganguli et al and Kim do not disclose:**

**Regarding claim 1**, a baffle plate member is provided to cover said gas outlet in order to prevent any un-evaporated metallic compound material from entering inside said gas outlet.

**Regarding claim 45**, said baffle plate member is provided in a configuration that a surface of said metallic compound material cannot directly be seen from said gas outlet.

**Regarding claim 46**, said baffle plate member is constituted by a bending plate in a form of U-shape in cross-section.

**Regarding claim 47**, said baffle plate member is constituted by a disk plate.

**Regarding claim 48**, said baffle plate member is constituted by a conical plate.

**Babcoke et al discloses:**

**Regarding claims 1, 45 and 47:** a bubbler comprising a baffle plate 39 (Figs 3, 5) covering the gas outlet in the shape of a disk (Fig 3) and an L-shaped plate (Fig 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a disk shape baffle plate in the apparatus of Ganguli et al and Kim to cover the gas outlet for preventing any un-evaporated metallic compound material from entering the gas outlet, provide the baffle plate in such a configuration that the surface of the metallic compound cannot directly be seen from the gas outlet in the apparatus of Ganguli et al and Kim as taught by Babcoke et al. It would have been obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a disk shape baffle plate in the apparatus of Ganguli et al and Kim to cover the gas outlet for prevent any unevaporated metallic compound material from entering the gas outlet, provide the baffle plate in such a configuration that the surface of the metallic compound cannot directly be seen from the gas outlet in the apparatus of Ganguli et al and Kim as taught by Babcoke et al.

The motivation for providing a disk shape baffle plate in the apparatus of Ganguli et al and Kim to cover the gas outlet for prevent any unevaporated metallic compound material from entering the gas outlet, provide the baffle plate in such a configuration that the surface of the metallic compound cannot directly be seen from the gas outlet in the apparatus of Ganguli et al and Kim is to prevent the evaporated material from entering the gas outlet in the apparatus of Ganguli et al and Kim as taught by Babcoke et al

**Ganguli et al, Kim and Babcoke et al do not disclose:**

**Regarding claim 46**, said baffle plate member is constituted by a bending plate in a form of U-shape in cross-section.

**Regarding claim 48**, said baffle plate member is constituted by a conical plate.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a baffle plate in the form of U-shape in cross section or in the shape of a conical plate in the apparatus of Ganguli et al, Kim and Babcoke et al.

The motivation for providing a baffle plate in the form of U-shape in cross section or in the shape of a conical plate in the apparatus of Ganguli et al, Kim and Babcoke et al is to provide an alternate and equivalent form of baffle plate in the apparatus of Ganguli et al, Kim and Babcoke et al. Further it has been held in *re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) that the shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape was significant. (Also see MPEP 2144.04(d)).

**Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganguli et al (US 6,772,072) in view of Kim (US 6,424,800) and Babcoke et al (US 2003/0042630) as discussed in claims 1 and 45 – 48 above and further in view of Westmoreland et al (US 5,902,651) and Girard et al (US 6,442,736).**

**Ganguli et al** as discussed above and discloses;

**Regarding claim 50**, a flow meter 134 and controller 136 which may be any suitable controller such as programmable logic controller (PLC) capable of calculating a

mass flow rate of the precursor 122 based on the signals generated by the flow meter 134 (Column 5, lines 39 – 45).

**Ganguli et al, Kim and Babcoke et al do not disclose:**

**Regarding claim 49**, a pressure detecting means for detecting the pressure inside said gas passage; and a controller for controlling said heating means so that a value detected by said pressure detecting means is maintained around a specific value.

**Westmoreland et al discloses:**

**Regarding claim 49**, a chemical vapor deposition apparatus (Fig) wherein a pressure gauge 70 for monitoring the pressure within the line 50 and a mass flow controller 54 for regulating desired mass flow rate to the reaction chamber is provided on the gas flow line 50 between the bubbler and the reaction chamber 10.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a pressure detecting means on the gas line in the apparatus of Ganguli et al and Kim as taught by Westmoreland et al. It would have been obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a pressure detecting means on the gas line in the apparatus of Ganguli et al and Kim as taught by Westmoreland et al.

The motivation for providing a pressure detecting means on the gas line in the apparatus of Ganguli et al and Kim is to monitor the line pressure in the gas line between the bubbler and the reaction chamber as taught by Westmoreland et al.

**Ganguli et al, Kim and Westmoreland et al do not disclose:**



**Regarding claims 49 and 50**, a controller for controlling said heating means so that a value detected by said pressure detecting means is maintained around a specific value.

**Girard et al discloses:**

**Regarding claims 49 and 50**, a bubbler 24 (Fig 2A) wherein a controller 21(Fig 1) sends a control signal to heater 26 to control the temperature of the water in the vessel 24.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a temperature controller for controlling the bubbler temperature in the apparatus of Ganguli et al, Kim and Westmoreland et al as taught by Girard et al. It would have been obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a temperature controller for controlling the bubbler temperature in the apparatus of Ganguli et al, Kim and Westmoreland et al as taught by Girard et al.

The motivation for providing a temperature controller for controlling the bubbler temperature in the apparatus of Ganguli et al, Kim and Westmoreland et al is to control the bubbler temperature in the apparatus of Ganguli et al, Kim as taught by Girard et al.

**Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ganguli et al (US 6,772,072) in view of Kim (US 6,424,800) and Babcoke et al (US 2003/0042630) as discussed in claims 1 and 45 – 48 above and further in view of Takeshita et al (US 2001/0017103).**

**Ganguli et al, Kim and Babcoke et al do not disclose:** a second carrier gas supply means connected to said gas passage, the gas flow amount of said second carrier gas supply means being controlled in response to changes of the gas flow amount of said first carrier gas supply means so that the gas flow amount fed into said material reservoir tank is maintained at a constant amount.

**Takeshita et al discloses:** a coating apparatus comprising a bubbler 63 (Fig 6) wherein a second carrier gas (nitrogen or ammonia gas) means is connected to the gas passage from the bubbler to the reaction chamber. Takeshita et al further discloses providing a mass flow controller 61 on the second carrier gas line. Controlling the flow rates of the second carrier gas in response to the changes of the gas flow amount of the said first carrier gas is the intended use of the apparatus and the apparatus of Takeshita et al is capable of controlling such gas flow-rates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a second carrier gas means connected to the gas passage between the bubbler and the reaction chamber in the apparatus of Ganguli et al, Kim and Babcoke et al as taught by Takeshita et al. It would have been obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a second carrier gas means connected to the gas passage between the bubbler and the reaction chamber in the apparatus of Ganguli et al, Kim and Babcoke et al as taught by Takeshita et al.

The motivation for providing a second carrier gas means connected to the gas passage between the bubbler and the reaction chamber in the apparatus of Ganguli et

al, Kim and Babcoke et al is to provide a second means of providing a carrier gas for controlling the precursor gas concentration in the carrier gas in the apparatus of Ganguli et al, Kim and Babcoke et al as taught by Takeshita et al.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 –and 45 - 51 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish Chandra whose telephone number is 571-272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Jeffrie R. Lund can be reached on 571-272-1437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrie R. Lund/  
Primary Examiner, Art Unit 1792

Satish Chandra

Jeffrie R. Lund  
Primary Examiner

SC  
8/15/2008